I have characterized the 40 coils into 4 different categories:

1. No defect (9 coils)
    a. 40, 39, 38, 36, 35, 34, 33, 32, 31.
    b. We can randomly choose 2 valid coils and 2 test coils.
2. Very less Defect (4 coils)
    a. 5(4 defected samples, 4 crossing)
    b. 8(94 defected samples, 94 crossing)
    c. 10(49 defected samples, 47 crossing, 2 Gap)
    d. 28(1 defected sample, 1 crossing)
    e. Randomly choose 1 valid and 1 test
3. Very well defected and have all classes. (21 coils)
    a. 30, 29, 27, 26, 25, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 9, 6, 4, 3, 2, 1
    b. We can randomly choose 2 valid coils and 2 test coils.
4. Very well defected but do not have all classes representations. (6 coils)
    a. 7 (368 defected samples, 366 gap, 67 cross)
    b. 11 (261 defected samples, 261 gap)
    c. 12 (724 defected samples, 724 gap, 223 cross)
    d. 23 (610 defected samples, 610 gap)
    e. 24 (783 defected samples, 344 double winding, 779 Gap, 1 crossing)
    f. 37 (338 defected samples, 338 gap)
    g. Randomly choose 1 valid and 1 test.